ORIGINAL ARTICLE

Analysis of Cesarean Section by Robson's Ten-Group Classification System in Nobel Medical College Teaching Hospital

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ABSTRACT

Background: To analyze the pattern of cesarean sections (CS) according to Robson's criteria.

Methods: A retrospective cross-sectional study was conducted for six months in a teaching hospital. Robson's classification was the study tool and its report table was the interpretation tool.

Results: Cesarean sections (CSR) was 48.6% and the maximum number of CS were contributed by Group 5 followed by 1 and 2, predominantly comprised by primary cesarean sections (Pr CS) and fetal distress (FD)

Conclusion: Sidestepping Pr CS carefully may help in lowering the CSR.

Key-Words: Cesarean section (CS), cesarean section rate (CSR), High Cesarean section rate (HCSR), Overall cesarean section rate (CSR), Robson Criteria.

INTRODUCTION

The rising rate of cesarean section (CS) has been a matter of concern globally, so Nepal also facing a similar situation too.[1] The CS rate (CSR) has almost doubled between 2000 (12.1%) and 2015 (21.1%).[2]

CS is associated with many short-term and long-term complications that significantly affect maternal and neonatal health (MNH).[3] The number of CS during subsequent pregnancy also affects maternal morbidity.[4] Therefore, a need for the rational use of CS is mandatory and CS is performed only when indicated where benefits outweigh its risks and costs.[5]

The World Health Organization (WHO) recommends an average of no more than 10-15% CS birth for optimal MNH. WHO proposes the Robson Classification system as a global standard for assessing, monitoring, and comparing CSR within healthcare facilities and between facilities.[6,7]

This study aims to analyze the trend of CS in the Nobel Medical College Teaching Hospital and categorize them according to WHO Robson's criteria

METHODS

A retrospective cross-sectional study was conducted in the Department of Obstetrics and Gynecology, from 15th June 2022 to 15th December 2022, in a study period duration of six months. Recruiting all the women who were admitted via outpatient department (OPD) and emergency and were delivered by CS, performed at ≥28 weeks of period of gestation (POG).

The study was carried out after ethical approval applying Robson's classification of CS for the consecutive cases [Fig-1].[6]
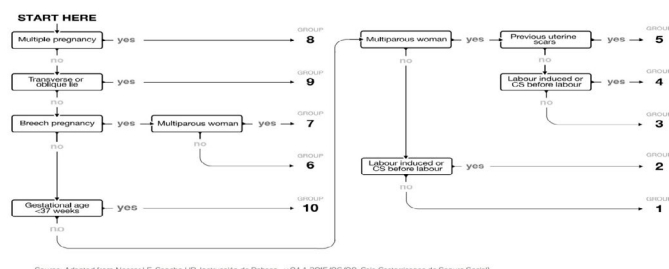
Fig 1: Robson classification and flow diagram of the study design[6]

RESULTS

During the six months study period, from July to December 2022, CS delivery (CSD) represented 1926 (48.6%) out of a total of 3959 births, vaginal deliveries marginally higher than the CSD, throughout all the six months. [Fig.2].

All the women who were delivered via CS were classified as per Robson's criteria in 10 different groups.
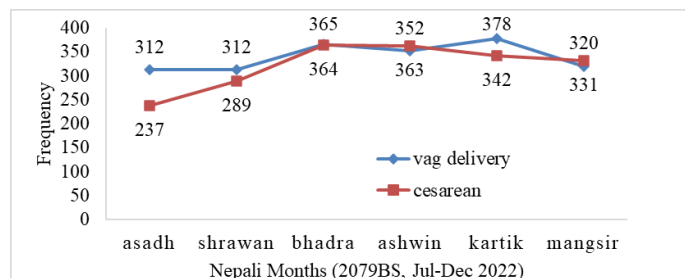
Fig 2: Number of Vaginal and CS deliveries

All CSDs were classified as per WHO Robson's criteria. The highest CSR (HCSR) was contributed by Group 5 (singleton pregnancy, term pregnancy, previous CS (Prev. CS). Thereby followed by Group 1 (Nulliparous, singleton, cephalic, term pregnancy in spontaneous labor) and Group 2 (Nulliparous, singleton, cephalic, term, induced or CS before labor) respectively. Group 10 similarly, included all preterm CS contributed to 10.2% of the OCSR. The lowest CSR (LCSR) was seen in Group 9, i.e. 0.62%. [Fig.3]
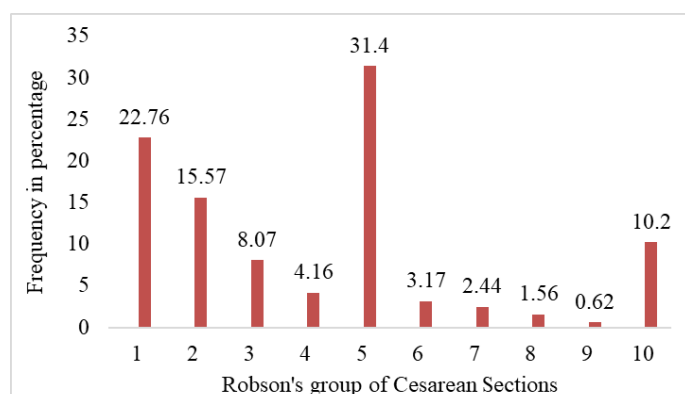
Fig 3. Group distribution of cesarean sections by Robson's criteria

In comparison with Robson's guideline, the Pr CS in nulliparous women was within the reference rate (38.33%) while those of multiparous women were less than that of the reference value (12.23%).

The size of Group 5 with previous (Prev) CS (31.4%) and Group 10 with preterm CS (10.2%) was higher than that of the recommended rate. [Table 1]

The total number of deliveries was equal to the total number of normal deliveries and CS. The size of Group 9 (transverse/oblique lie) was <0.62%, which entirely underwent CS (100%). [Table 2]

Table 1: Assessing the type of population using the Robson classification Report Table

Step	Study population	Robson guideline
1. Size of Group 1+2	38.33%	35-42%
2. Size of Group 3+4	12.23%	30%
3. Size of Group 5	31.40%	Half of the total CSR
4. Size of Group 6+7	5.61%	3-4%
5. Size of Group 8	1.56%	1.5-2%
6. Size of Group 10	10.20%	< 5%
7. Ratio of size of Group 1:2	1.468 :1	2:1 or higher
8. Ratio of size of Group 3:4	1.96: 1	Higher than Group 1:2
9. Ratio of size of Group 6:7	1.29: 1	2:1

Table 2: Assessment of quality of data using Robson Classification Report table

Step	Study population	Robson interpretation
Total delivery	N/A	Identical to CS and VD
Size of Group 9	0.62%	<1%
CSR of Group 9	100%	100% by convention

In our study, the highest CSR (HCSR) was contributed by Prev CS not willing to undergo a trial of labor after cesarean (TOLAC), followed by fetal distress (FD). However, the most common cause of Pr CS) was FD. The absolute indications for CS included FD, antepartum hemorrhage (APH), cephalopelvic disproportion (CPD), malpresentation, and obstructed labor while relative indications included Prev CS, oligohydramnios, IUGR, failure to progress, twin pregnancy, heart disease, severe pre-eclampsia and eclampsia (SPE/E). [Fig 4]
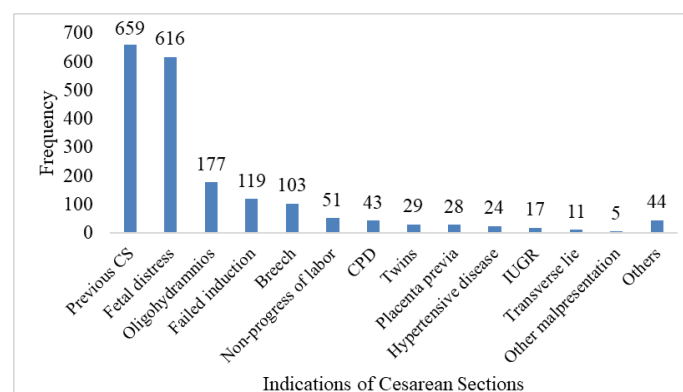
Fig 4: Indications of Cesarean Section

DISCUSSION

Our HCSR of 48.6% [(n=1926)/ 3959 births] compared to the WHO reference rate (10-15%), is explainable from the standpoint, that this hospital is a tertiary care referral center in the Eastern region of the country destined to receive a referral of a large number of high-risk complicated cases.

Our HCSR findings share similarities to research findings of two studies carried out in tertiary care centers, Nepal exhibiting CSR (44.22%) [~ 1412 /3193 (at 95% Confidence Interval (42.49-45.94)].[8] Next study kin, is about, holding same study period, six

months duration with OCSR 34% (32-35%)/10500 births.[9]

Above all, also comparable is the conglomerated result findings from five public hospitals in 5 Southeast countries, displaying CSR 36% (22-53%) for 37,251 CS.[10]

The above finding with HCSR can be correlated to a significant rise in CS in Eastern Asia (44.9%), followed by Western Asia (34.7%) and Africa (31.5%) respectively as put forth by global data between 2010-2018 from 154 countries.[11]

In our study, Pr. CS Group (1+2+3+4) that contributed to more than 50% of total CS coincided with data bearing the same group combination and constituting 40% of CS. It can be emphasized that these Groups (1-4) are likely to result in a larger Group 5 shortly.[12]

Breech CS, Group (6+7) constituted 4% and malpresentation including breech, Group (6+7+9) comprised 4.62 % of the OCSR in the index study corroborating somewhat to lesser rate CSR [(7% and 9%)[10] and (7.1% and 8%)[13] respectively.

Malpresentation is the lowest contributor in Group 9 (0.62%) where all the women had undergone CS (100%). A similar result has been demonstrated where CS constituted 100% in Group 9.[14]

Eventually, Prev CS, followed by FD were the two most common indications for CS in our study, while the reason for Pr CS remained FD. Thus, Group 5 followed by Groups 1 and 2 contributed the most.

The contributor of HCSR is differently quoted. Consecutive occurrence of Group 5, Groups 1 and Group 2 likes ours.[12,15] Additional being Group 5 followed by Group 2 and 4 respectively.[16]

A combination of Groups 1, 2, and 5 was the highest attribute to OCSR quantifying (69.73%) by us, setting the benchmark as other researchers.[10 17,18]

Group 5 (Prev CS)/ 5000 CS, has been documented as the highest contributor of OCSR and the increase in CSR mainly in nulliparas contributed to HCSR.[19]

This was also conveyed in a secondary analysis of the WHO multicentric survey from 2 countries, which stated that Prev CS is the first and foremost important determinant of OCSR.[20] Whereas a systematic review of 68 countries opined Prev CS to be the second common indication for CS after FD.

CONCLUSION

The prime focus should be targeted on reducing the primary cesarean section rate, essentially by unearthing concrete cases of fetal distress that may duly help to reduce the previous cesarean delivery and thus overall cesarean section rate.

REFERENCES

1. Cornel MA, Baraka LM, Justice M, Harold LM. Global increased cesarean section rates and public health implications: A call to action. Health Sci Rep. 2023;6(5):e1274.
DOI: 10.1002/hsr2.1274

2. Boerma T, Ronsmans C, Melesse DY, Barros AJD, Barros FC, Juan L, et al. Global epidemiology of use of and disparities in cesarean sections. The Lancet. 2018;392(10155):1341–8.
DOI: 10.1016/S0140-6736(18)31928-7

3. Sandall J, Tribe RM, Avery L, Mola G, Visser GH, Homer CS, et al. Short-term and long-term effects of cesarean section on the health of women and children. The Lancet. 2018;392(10155):1349–1357.
DOI: 10.1016/S0140-6736(18)31930-5

4. Korb D, Goffinet F, Seco A, Chevret S, Deneux-Tharaux C. Risk of severe maternal morbidity associated with cesarean delivery and the role of maternal age: a population-based propensity score analysis. Canad Med Assoc J. 2019;191(13):E352–E360.
DOI: 10.1503/cmaj.181067

5. Mascarello KC, Horta BL, Silveira MF. Maternal complications and cesarean section without indication: systematic review and meta-analysis. Revista de Saúde Pública. 2017;51:105.
DOI: 10.11606/S1518-8787.2017051000389

6. WHO Statement on Caesarean Section Rates. 2015. URL: https://iris.who.int/bitstream/handle/10665/161442/WHO_RHR_15.02_eng.pdf?sequence=1

7. WHO. Robson Classification: Implementation Manual. Geneva: World Health Organization; 2017. License: CC BY-NC-SA 3.0 IGO. URL: https://iris.who.int/bitstream/handle/10665/259512/9789241513197-eng.pdf?sequence=1

8. Tamrakar R, Sapkota S, Sitaula D, Thapa R, Pokhrel B, Acharya S, et al. Cesarean Section Among all Deliveries in a Tertiary Care Centre of Nepal: A Descriptive Cross-sectional Study. J Nepal Med Assoc. 2021;59(241):839-843
DOI:10.31729/jnma.6667

9. Baral G, Shrestha A, Sah A, Gupta AK. Robsons Ten Group Classification of

10. Cesarean Section at a Tertiary Center in Nepal. J Nepal Health Res Counc. 2021;19(1):91-96.
DOI: 10.33314/jnhrc.v19i1.2694

11. Hassan L, Woodbury L, Jamal N, Baral G, Ferdous J, Sohail R, et al. Examining the Efficacy of the Robson Classification System for Optimizing Cesarean Section Rates in South Asia. J South Asian Feder Obst Gynae. 2020;12(6):366–371.
DOI: 10.5005/jp-journals-10006-1846

12. Betran AP, Ye J, Moller A, Souza JP, Zhang J. Trends and projections of cesarean section rates: global and regional estimates. BMJ Global Health. 2021;6:e005671.
DOI: 10.1136/bmjgh-2021-005671

13. Kazmi T, Saiseema S, Khan S. Analysis of Cesarean Section Rate - According to Robson's 10-group Classification. Oman Med J. 2012;27(5):415-7.
DOI:10.5001/omj.2012.102

14. Abubeker, FA, Gashawbeza B, Gebre TM, Wondafrash M, Teklu AM, Degu D, et al. Analysis of cesarean section rates using Robson ten group classification system in a tertiary teaching hospital, Addis Ababa, Ethiopia: a cross-sectional study. BMC Pregnancy Childbirth. 2020;20(767).
DOI: 10.1186/s12884-020-03474-x

15. Jogia PD, Lodhiya KK. Analysis of cesarean sections according to modified Robson's ten-group classification system at a tertiary care center in Western India. Int J Reprod Contracept Obstet Gynecol. 2019;8(2):433-9.
DOI: 10.18203/2320-1770.ijrcog20190264

16. Assefa EM, Janbo A, Ghiwot Y. Comparative analysis of cesarean section using Robson's Ten-Group Classification System (RTCGS) in private and public hospitals, Addis Ababa, Ethiopia. Clin J Obstet Gynecol. 2021;4:081-091.
DOI: 10.29328/journal.cjog.1001093

17. Janani L, Christina S, Akoijam BS, Nameirakpam D, Laiphrakpam RS. Analysis of cesarean section rates and its indications using Robson's classification at a tertiary care hospital, Manipur. Indian J Public Health. 2022;66:434-8.
DOI:10.4103/ijph.ijph_1928_21

18. Koteshwara S, Sujatha MS. Analysis of cesarean section rates using Robson's ten group classification: the first step. Int J Reprod Contracept Obstet Gynecol. 2017;6(8):3481-3485. DOI: 10.18203/2320-1770.ijrcog20173468

19. Konar H, Sarkar M, Chowdhury S. Analysis of Caesarean Section Rates Using the Robson Ten-group Classification at a Tertiary Care Teaching Hospital in Eastern India: A Cross-sectional Study. J Clin Diag Research. 2021;15(3):QC24-QC28. DOI:10.7860/JCDR/2021/46668.14676

20. Baser A, Sharma S, Kumar S, Sabu A, Gupta A, Shaikh SS. Indication for Cesarean Section as per Robsons's Criteria: An Analysis of 5000 Consecutive Cesarean Cases. J South Asian Feder Obst Gynae. 2021;13(1):22–25. DOI: 10.22541/au.160068437.71196784

21. Vogel JP, Betrán AP, Vindevoghel N, SouzA JP, Torloni MR, Zhang J, et al. Use of the Robson classification to assess cesarean section trends in 21 countries: a secondary analysis of two WHO multi-country surveys. The Lancet Global Health. 2015;3(5):e260–e270. DOI: 10.1016/S2214-109X(15)70094-X

22. Dhakal-Rai S, Teijlingen EVE, Regmi PR, Wood J, Dangal G, Dhakal KB. Factors contributing to rising cesarean section rates in South Asian countries: A systematic review. Asian J Med Sci. 2022;13(2):143–174. DOI: 10.3126/ajms.v13i2.40904